DISPERSED FLUORESCENCE SPECTROSCOPY OF $H_2CO$ IN A FREE-JET EXPANSION

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High resolution dispersed fluorescence (DF) spectra of the excited vibrational levels in formaldehyde have been recorded to describe its $S_0$ potential energy surface. Formaldehyde was cooled in a free-jet expansion and excited with a laser to the $4^1$, $4^0$, $3^1 4^1$ and $5^1$ levels in $S_1$. The resulting fluorescence was dispersed with a monochromator to yield $S_0$ vibrational spectra. Over 268 vibrational transitions have been assigned and fit to a polyad model. The model includes harmonic and anharmonic terms, and also accounts for resonances among vibrational levels. The results are compared to ab initio calculations.